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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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HOWREY LLP C/O IP DOCKETING DEPARTMENT 2941 FAIRVIEW PARK DR, SUITE 200 FALLS CHURCH, VA 22042-2924			ART UNIT 2662	PAPER NUMBER

DATE MAILED: 10/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/927,359

Applicant(s)

STEVEN G. SCHMIDT

Examiner

Habte Mered

Art Unit

2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 14-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 14-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

1. The amendment filed on 10 August 2005 has been entered and fully considered.
2. Claims 2-13 are cancelled by the Applicant as stated in the amendment filed on 10 August 2005.
3. Claims 1 and 14-22 are currently pending.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1 and 14-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al (US 6, 240, 075), hereinafter referred to as Takahashi, in view of Caldara et al (5, 978, 359), hereinafter referred to as Caldara.

Takahashi teaches a switch with a set of input and output ports with a means to arbitrate output contention.

6. Regarding **claims 1 and 14**, Takahashi teaches a multiple arbitration system capable of arbitrating multiple paths comprising (**Column 1, Lines 30-35**):

a) a plurality of source ports and destination ports (**See Figure 1, IP1...IP128 (input ports), OP1...OP128(output ports)**)

b) an arbitration circuit for arbitrating paths from the source ports to the destination ports to prevent multiple source paths from being simultaneously connected to the same destination port, the arbitration

circuit maintaining a connection between a first source port and a first destination port. **(See Figure 1 – element 82 is the arbiter with multiple arbitration capability. Column 3, Lines 12-20 and 30-35; Column 4, Lines 34-40)**

c) connecting at least one of the destination ports to at least one of the source ports **(Column 3, Lines 12-20)**

Takahashi, however, fails to disclose that the established connection between a given input and a specific output is maintained until an express command is received to disconnect the connection, whereby the connection is maintained even in light of connection requests received at a later time from other source ports desiring to connect with the first destination port.

Caldara teaches allocated and dynamic switch flow control.

Caldara discloses that an established connection between a given input and a specific output is maintained until an express command is received to disconnect the connection, whereby the connection is maintained even in light of connection requests received at a later time from other source ports desiring to connect with the first destination port. **(See Column 2, Lines 51-67 and Column 3, Lines 1-10. The express message is XOFF which is identical to what the Applicant teaches on Page 7 of the Specification in Lines 1-2.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Takahashi' apparatus to incorporate flow control messages. The motivation being Takahashi shows the existence of input

queues/buffers in Figure 1 and Caldara shows how cell loss is minimized using flow control messages like XOFF in an environment similar to that of Takahashi with crossbar switch and an arbiter as shown in his Figure 1 and further illustrated in Caldara's Column 3, Lines 51-67 and Caldara's Column 4, Lines 1-10.

7. Regarding **claim 15**, Takahashi further discloses a system further comprising:

- c) for each pair of a source port S and a destination port D, a path connecting S to D, the path at a given time being either open, in which case data can flow from S to D, or closed, in which case data cannot flow from S to D (**See Column 3, Lines 12-20 and 30-35; Column 4, Lines 34-40. This is simply a terminology issue. Open simply means there is a connection and closed simply means there is no connection while Takahashi uses the phrase "electrically coupled" to mean the same thing. Of course it is inherent to Takahashi's system to use an electrical system in the form of integrated circuit, which can be open or close depending on the circuitry used. Further he indicates in Column 4, Lines 56-59 any circuitry is applicable to his invention.)**
- d) a request decoder forming part of the arbitration circuit and being assigned to source port S, the request decoder, on behalf of source port S, creating requests to connect to or disconnect from destination port D, sending such requests, and monitoring the status of each request; (**See Figure 2, element 220 and Column 6, Line 10)**
- e) a request prioritizer (**See Figure 2, elements 230 and 240**) forming part of the

arbitration circuit and being assigned to destination port D, the request prioritizer opening and closing paths in response to the requests (**Column 4, Lines 34-55 and Column 6, Lines 1-20**), such that:

- (i) if only one source port requests to connect to a given destination port, then the corresponding path to source port S will be open(**Inherent to all arbiters and simply means connection will be established as Takahashi teaches in Column 4, Lines 34-55 and Column 6, Lines 1-20**);
- (ii) if multiple source ports request to connect to a single destination port D at the same time, then the requests will be prioritized, source S will be chosen, and a path from S to D will be open (**Column 4, Lines 34-55 and Column 6, Lines 1-20**); and
- (iii) once a given path is opened it will remain open until an express command to disconnect has been received from the request decoder.(**This is true and inherent to any hardware system. An interrupt message will cause the connection to drop and using the Applicant terminology – the path will have to close if an interrupt occurs.**)

8. Regarding **claim 16**, Takahashi discloses all aspects of the claimed invention as set forth in the rejection of claim 15 but fails to disclose a multiple arbitration system, wherein if a path is open to a given destination, the request prioritizer will suspend communication across the path upon receipt of an XOFF signal and allow

Art Unit: 2662

communication across the path upon receipt of an XON signal; or if no path is open to a given destination, the request prioritizer will refuse requests for connection to the destination upon receipt of an XOFF signal and resume processing of requests for connection to the destination upon receipt of an XON signal.

Caldara teaches a multiple arbitration system, wherein if a path is open to a given destination, the request prioritizer will suspend communication across the path upon receipt of an XOFF signal and allow communication across the path upon receipt of an XON signal; or if no path is open to a given destination, the request prioritizer will refuse requests for connection to the destination upon receipt of an XOFF signal and resume processing of requests for connection to the destination upon receipt of an XON signal. **(See Column 2, Lines 51-67 and Column 3, Lines 1-10.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Takahashi' apparatus to incorporate flow control messages. The motivation being Takahashi shows the existence of input queues/buffers in Figure 1 and Caldara shows how cell loss is minimized using flow control messages like XOFF and XON in an environment similar to that of Takahashi with crossbar switch and an arbiter as shown in his Figure 1 and further illustrated in Caldara's Column 3, Lines 51-67 and Caldara's Column 4, Lines 1-10.

9. Regarding **claim 17**, Takahashi teaches a multiple arbitration system, wherein the request prioritizer for destination port D sends a signal to each source port whether the path from the source port to D is open or closed, and the source port determines whether it is connected to any destination by examining such signals from all the

destination ports. **(This is again is inherent to any switching system to have two entities connecting to indicate to each other the connection is successful or not.)**

10. Regarding **claim 18**, Takahashi teaches a multiple arbitration system, wherein an open connection will close after it has been open for a preset amount of time, or by request upon occurrence of some previously specified programmatic condition. **(Once again this is an inherent phenomena in a switching system. Connections are up for a specified time and when timers expire the connection is torn down. Further in hardware design it is common to have a system interrupt tear down a connection or call when a fault occurs and when the fault is detected automatically via embedded programs.)**

11. Regarding **claim 19**, Takahashi teaches a multiple arbitration system, further comprising: f) a fiber channel switch containing the source ports, the destination ports, the request decoders, and the request prioritizers. **(Takahashi shows the source ports (IP1...IP128) and destination ports (OP1...OP128) in Figure 1 and the decoder (220) and Prioritizer (230,240) in Figure 2. It is known in the art to those ordinarily skilled in the art that fiber channel switch is an entity that can transmit data from its input port to its output port at a high speed with low latency irrespective of the end units connected to it and can accommodate multiple simultaneous point-to-point connections. Takahashi's switch adequately meets this definition as it is designed for a high-speed satellite communication system in an ATM environment. See Column 1, Line 5)**

Art Unit: 2662

12. Regarding **claim 20**, Takahashi teaches a method, wherein: the step of arbitrating multiple paths further comprises

i) establishing in advance a prioritization scheme for prioritizing competing requests from source ports for connection to each destination port; **(Column 4, Lines 34-55)**

ii) upon sending a request R to connect a source port S to a destination port D, using the prioritization scheme to prioritize R against any requests from other source ports to connect to D; the step of connecting further comprises opening a connection from source S to destination D when D is not already connected to a source port and request R is determined to have the highest priority of all current requests from source ports to connect to D; **(Column 5, Lines 35-65)** and further comprising

d) providing a first indication to source S when the connection to a destination D is open and a second indication to each source S whose connection to D is closed; **(Inherent to all switching systems arbiters)** and

e) monitoring at source S, on an ongoing basis, signals from destination ports to determine whether at a particular time S has an open connection to any destination port. **(Inherent to all switching systems arbiters)**

13. Regarding **claim 21**, Takahashi discloses all aspects of the claimed invention as set forth in the rejection of claim 20 but fails to disclose a process further comprising:

f) if an XOFF signal is received for a given destination and a connection to that destination is open, suspending communication across that connection;

g) if an XON signal is received for a given destination and a connection to that destination is open, allowing communication across that connection;

Art Unit: 2662

h) if an XOFF signal is received for a given destination and no connection to that destination is open, refusing any requests for connection to that destination; and
i) if an XON signal is received for a given destination and no connection to that destination is open, resuming processing of requests for connections to that destination.

Caldara teaches a process further comprising: f) if an XOFF signal is received for a given destination and a connection to that destination is open, suspending communication across that connection; g) if an XON signal is received for a given destination and a connection to that destination is open, allowing communication across that connection; h) if an XOFF signal is received for a given destination and no connection to that destination is open, refusing any requests for connection to that destination; and i) if an XON signal is received for a given destination and no connection to that destination is open, resuming processing of requests for connections to that destination. **(See Column 2, Lines 51-67 and Column 3, Lines 1-10.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Takahashi' apparatus to incorporate flow control messages. The motivation being Takahashi shows the existence of input queues/buffers in Figure 1 and Caldara shows how cell loss is minimized using flow control messages like XOFF and XON in an environment similar to that of Takahashi with crossbar switch and an arbiter as shown in his Figure 1 and further illustrated in Caldara's Column 3, Lines 51-67 and Caldara's Column 4, Lines 1-10.

14) Regarding **claim 22**, Takahashi teaches a process, further comprising:

j) closing an open connection after it has been open for a preset amount of time, or upon the occurrence of a previously specified programmatic condition. **(Once again this is an inherent phenomena in a switching system. Connections are up for a specified time and when timers expire the connection is torn down. Further in hardware design it is common to have a system interrupt tear down a connection or call when a fault occurs and when the fault is detected automatically via embedded programs.)**

Response to Amendment

15. Applicant's arguments filed on 10 August 2005 have been fully considered but they are not persuasive.

16. Applicant's arguments in the Remarks, on page 6, against the prior arts cited by the Examiner are irrelevant since the Applicant has significantly amended all independent claims to cause a new search. Consequently the Examiner in this Office Action has provided a new set of rejections based on a new set of prior art.

17. Applicant, in the Remarks, on page 7, in the last paragraph argues that the use of Fiber Channel switch makes the invention distinct. Further Applicant seems to suggest open connection is an optical connection. Examiner respectfully disagrees with the Applicant's conclusion. The Examiner has provided the definition of Fiber channel switch in this Office Action in the rejections of different claims. Based on the specification provided by the Applicant open connection is a simple electrical connection in the switch. Optical entities are connected to an electrical fiber channel switch via adapters but the switch described in the specification is an electrical switch.

Art Unit: 2662

18. The Examiner would like to point out in the Remarks, on page 7 in the second paragraph, the Applicant correctly cites the purpose of xOFF signal as meant to "temporarily suspend data". However, the amended claim 1 suggests the express command is intended for "disconnecting the connection" which is incorrect based on the explanation from the specification on Page 7 (Lines 1-5) and based on the citation from the Remarks. Technically speaking the claim is not supported by the specification. However, since it is the goal of the Office to provide compact prosecution the rejection provided also addresses the unclaimed limitation stated in the specification.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

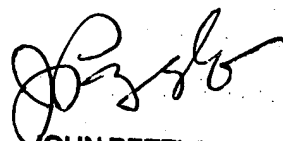
Art Unit: 2662

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HM
10-27-2005


JOHN PEZZLO
PRIMARY EXAMINER